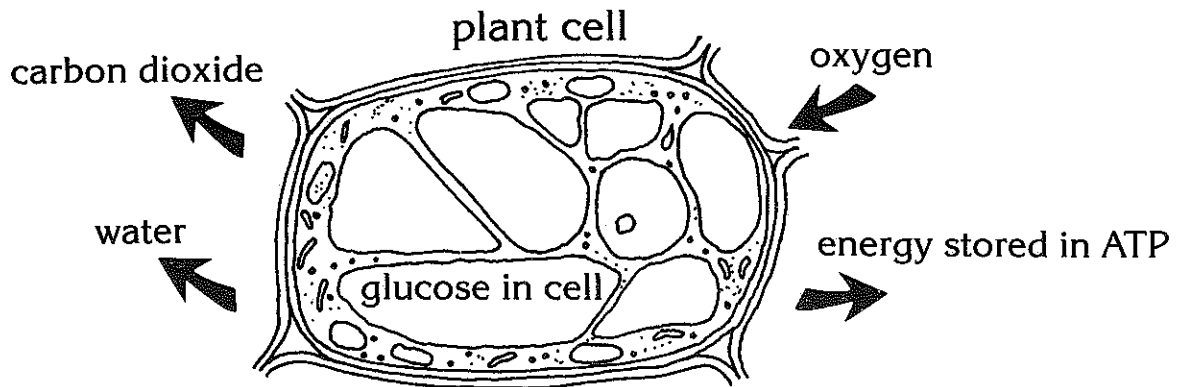
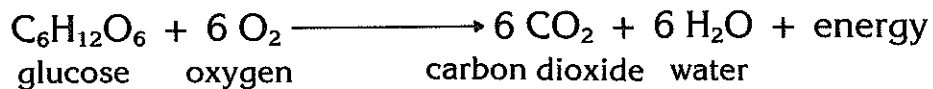


# Respiration

*Respiration* is the process by which energy is released for cell use.



## General Formula for Respiration



1. Complete the comparison chart below by indicating the way each component listed is used or produced:

	Photosynthesis	Respiration
a. glucose	_____	_____
b. oxygen	_____	_____
c. carbon dioxide	_____	_____
d. water	_____	_____

2. The energy for respiration comes from \_\_\_\_\_.
3. What are the products of respiration? \_\_\_\_\_
4. In fermentation, glucose is broken down and carbon dioxide and alcohol are produced. Is fermentation a form of photosynthesis or respiration? \_\_\_\_\_
- Explain your answer. \_\_\_\_\_

5. Write photosynthesis or respiration before each statement.

- \_\_\_\_\_ a. occurs day and night
- \_\_\_\_\_ b. occurs in all living plant cells
- \_\_\_\_\_ c. produces carbon dioxide gas
- \_\_\_\_\_ d. Glucose is formed.
- \_\_\_\_\_ e. Chlorophyll is energized.

Write T (true) or F (false)  
for each statement.

### HEREDITY

84. RNA is the genetic material in the cell that controls every inherited trait. ☐

85. A gene is the basic unit of inheritance passed from parents to offspring. ☐

86. Gregor Mendel discovered basic laws of heredity by studying corn plants. ☐

87. A recessive form of a trait prevents the dominant form from showing. ☐

88. An offspring gets half its genes from each parent. ☐

The Punnett square below shows the possible ways that genes can combine for the trait of tallness (height) in a plant.

The **T** stands for the dominant gene for tallness. The **t** stands for the recessive gene (the gene for Not tall-or shortness). Pure tall is labeled **TT**. Pure short is labeled **tt**. **Tt** is hybrid tall.

One parent is **TT** (pure tall), with both genes dominant.

The other parent is **Tt** (hybrid tall) with one dominant and one recessive gene.

89. Finish the Punnett square by filling in the results.

	<b>T</b>	<b>T</b>
<b>T</b>	<input type="text"/>	<input type="text"/>
<b>t</b>	<input type="text"/>	<input type="text"/>

90. Which of these describes the offspring?

- a. 25% pure tall, 50% hybrid tall, 25% pure short
- b. 50% pure tall, 50% pure short
- c. 100% hybrid tall
- d. 100% pure tall
- e. 50% pure tall, 50% hybrid tall

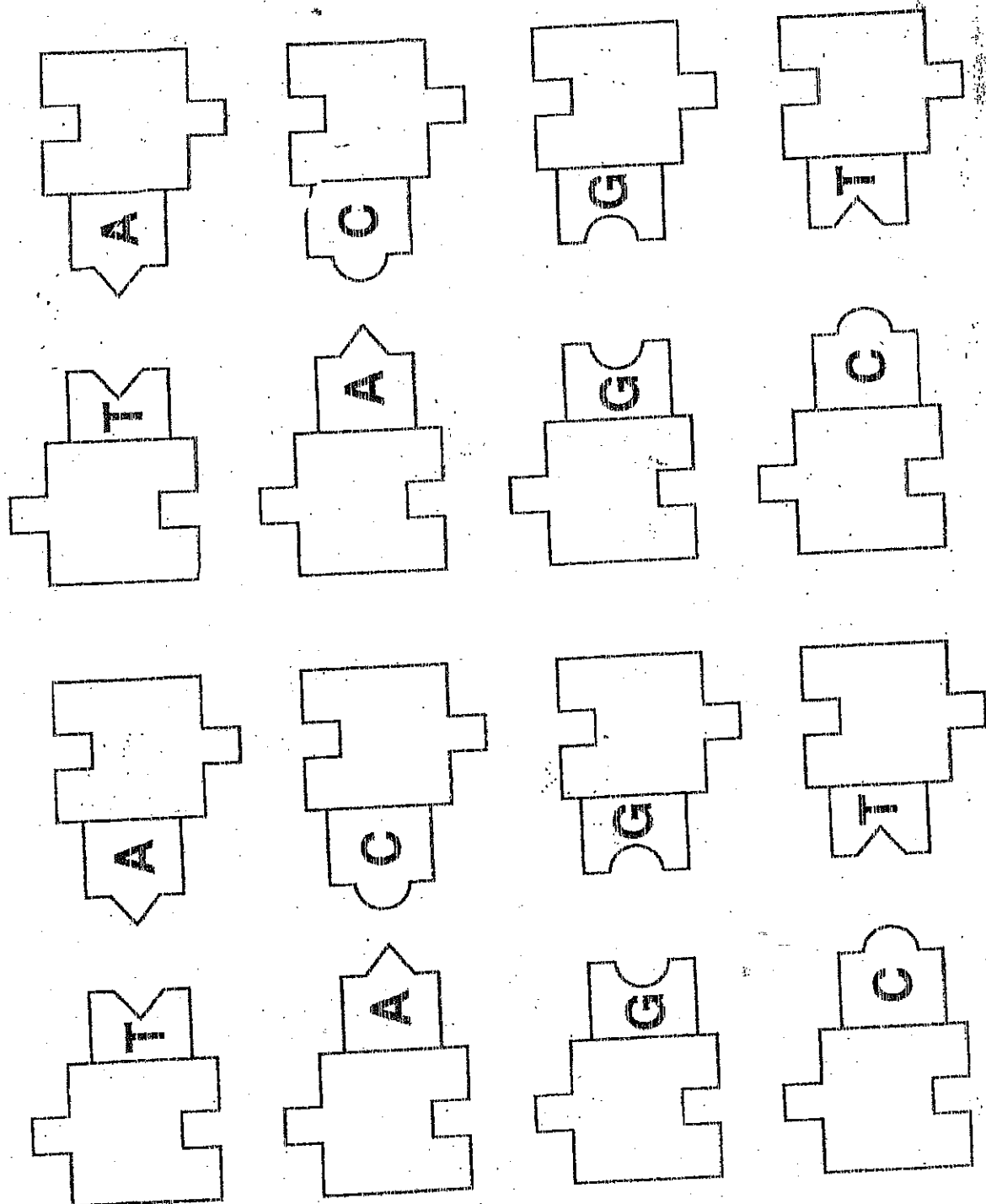


Name \_\_\_\_\_

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Name \_\_\_\_\_



# What Does a DNA Molecule Look Like?

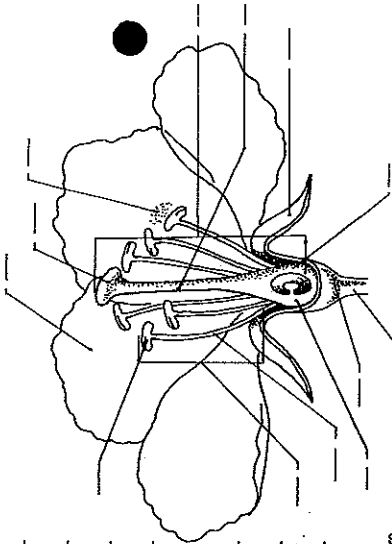


## STRUCTURE OF A FLOWER

Name \_\_\_\_\_

Label the parts of the flower in the diagram below. Give the purpose/function of each part.

- a. ovary \_\_\_\_\_
- b. style \_\_\_\_\_
- c. stigma \_\_\_\_\_
- d. sepal \_\_\_\_\_
- e. receptacle \_\_\_\_\_
- f. pedicel \_\_\_\_\_
- g. petal \_\_\_\_\_
- h. filament \_\_\_\_\_
- i. anther \_\_\_\_\_
- j. pollen grain \_\_\_\_\_
- k. pistil \_\_\_\_\_
- l. stamen \_\_\_\_\_
- m. ovule \_\_\_\_\_



Fill in the blanks with the correct answers.

If there are to be more flowers, \_\_\_\_\_ must take place. In pollination, pollen is transferred from the \_\_\_\_\_ to the \_\_\_\_\_. In detail, pollen is transferred from the \_\_\_\_\_ of the stamen to the \_\_\_\_\_ of the pistil. In some flowers, pollen falls on the stigma of the \_\_\_\_\_ flower. \_\_\_\_\_-pollination occurs. In other flowers, pollen from \_\_\_\_\_ flower falls on the stigma of a \_\_\_\_\_ flower. \_\_\_\_\_ pollination takes place.

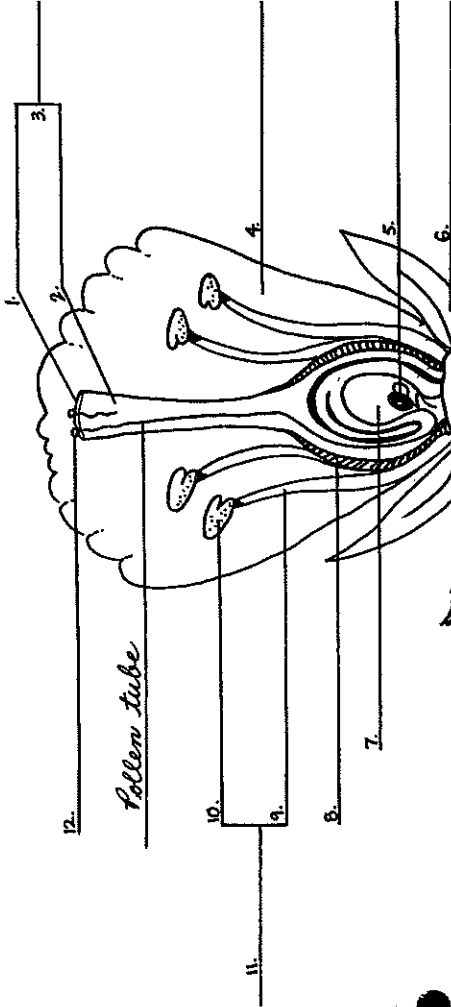
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## WHAT DO BEES KNOW?

This know-it-all bee thinks he can describe the pollination and fertilization that takes place in this flower. Does he know as much as he thinks? Read through his explanation and find the errors. Cross out and fix anything that is not correct.



Accurately label the parts of the flower. Tell briefly what each one does.

- embryo
- petal
- stamen
- anther
- filament
- pollen tube
- pistil
- ovary
- stigma
- style
- ovule
- sepal
- pollen

I'm the really important part of the whole plant! I carry sepals from the stigma on top of the stamens on one flower and leave them on the sticky anther (which is part of the pistil) of another.

After I leave this stuff on the sticky anther, a sepal grows through the petal toward the ovule. The egg passes out of the pollen tube into the sperm and fertilizes it.

The fertilized seed develops into an embryo, and the wall of the surrounding ovary develops into a fruit. When the fruit bursts open or is thrown on the ground, the seeds fall into the ground and start new plants.

Name \_\_\_\_\_

The BASIC/Not Boring Middle Grades Science Book

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# **Bikini Bottom Genetics**

Name \_\_\_\_\_

Scientists at Bikini Bottom have been investigating the genetic makeup of the organisms in this community. Use the information provided and your knowledge of genetics to answer each question.

1. For each genotype below, indicate whether it is a heterozygous (He) OR homozygous (Ho).

TT \_\_\_\_\_ Bb \_\_\_\_\_ DD \_\_\_\_\_ Ff \_\_\_\_\_ tt \_\_\_\_\_ dd \_\_\_\_\_  
Dd \_\_\_\_\_ ff \_\_\_\_\_ Tt \_\_\_\_\_ bb \_\_\_\_\_ BB \_\_\_\_\_ FF \_\_\_\_\_

Which of the genotypes in #1 would be considered purebred? \_\_\_\_\_

Which of the genotypes in #1 would be hybrids? \_\_\_\_\_

2. Determine the phenotype for each genotype using the information provided about SpongeBob.

Yellow body color is dominant to blue.

YY \_\_\_\_\_ Yy \_\_\_\_\_ yy \_\_\_\_\_

Square shape is dominant to round.

SS \_\_\_\_\_ Ss \_\_\_\_\_ ss \_\_\_\_\_

3. For each phenotype, give the genotypes that are possible for Patrick.

A tall head (T) is dominant to short (t).

Tall = \_\_\_\_\_ Short = \_\_\_\_\_

Pink body color (P) is dominant to yellow (p).

Pink body = \_\_\_\_\_ Yellow body = \_\_\_\_\_

4. SpongeBob SquarePants recently met SpongeSusie Roundpants at a dance. SpongeBob is heterozygous for his square shape, but SpongeSusie is round. Create a Punnett square to show the possibilities that would result if SpongeBob and SpongeSusie had children. HINT: Read question #2!

- A. List the possible genotypes and phenotypes for their children.


- B. What are the chances of a child with a square shape? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %
- C. What are the chances of a child with a round shape? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %

5. Patrick met Patti at the dance. Both of them are heterozygous for their pink body color, which is dominant over a yellow body color. Create a Punnett square to show the possibilities that would result if Patrick and Patti had children. HINT: Read question #3!

- A. List the possible genotypes and phenotypes for their children.


- B. What are the chances of a child with a pink body? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %
- C. What are the chances of a child with a yellow body? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %

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6. Everyone in Squidward's family has light blue skin, which is the dominant trait for body color in his hometown of Squid Valley. His family brags that they are a "purebred" line. He recently married a nice girl who has light green skin, which is a recessive trait. Create a Punnett square to show the possibilities that would result if Squidward and his new bride had children. Use B to represent the dominant gene and b to represent the recessive gene.

- A. List the possible genotypes and phenotypes for their children.


- B. What are the chances of a child with light blue skin? \_\_\_\_\_ %

- C. What are the chances of a child with light green skin? \_\_\_\_\_ %

- D. Would Squidward's children still be considered purebreds? Explain!

7. Assume that one of Squidward's sons, who is heterozygous for the light blue body color, married a girl that was also heterozygous. Create a Punnett square to show the possibilities that would result if they had children.

- A. List the possible genotypes and phenotypes for their children.


- B. What are the chances of a child with light blue skin? \_\_\_\_\_ %

- C. What are the chances of a child with light green skin? \_\_\_\_\_ %

8. Mr. Krabbs and his wife recently had a Lit' Krabby, but it has not been a happy occasion for them. Mrs. Krabbs has been upset since she first saw her new baby who had short eyeballs. She claims that the hospital goofed and mixed up her baby with someone else's baby. Mr. Krabbs is homozygous for his tall eyeballs, while his wife is heterozygous for her tall eyeballs. Some members of her family have short eyes, which is the recessive trait. Create a Punnett square using T for the dominant gene and t for the recessive one.

- A. List the possible genotypes and phenotypes for their children.


- B. Did the hospital make a mistake? Explain your answer.

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# Bikini Bottom Genetics 2

Name \_\_\_\_\_

Use your knowledge of genetics to complete this worksheet.

1. Use the information for SpongeBob's traits to write the phenotype (physical appearance) for each item.

Trait	Dominant Gene	Recessive Gene
Body Shape	Square (S)	Round (s)
Body Color	Yellow (Y)	Blue (y)
Eye Shape	Round (R)	Oval (r)
Nose Shape	Long (L)	Stubby (l)

- (a) LL \_\_\_\_\_ (e) Rr \_\_\_\_\_  
 (b) yy \_\_\_\_\_ (f) ll \_\_\_\_\_  
 (c) Ss \_\_\_\_\_ (g) ss \_\_\_\_\_  
 (d) RR \_\_\_\_\_ (h) Yy \_\_\_\_\_

2. Use the information in the chart in #1 to write the genotype (or genotypes) for each trait below.

- (a) Yellow body - \_\_\_\_\_ (e) Stubby nose - \_\_\_\_\_  
 (b) Roundpants - \_\_\_\_\_ (f) Round eyes - \_\_\_\_\_  
 (c) Oval eyes - \_\_\_\_\_ (g) Squarepants - \_\_\_\_\_  
 (d) Long nose - \_\_\_\_\_ (h) Blue body - \_\_\_\_\_

3. Determine the genotypes for each using the information in the chart in #1.

- (a) Heterozygous round eyes - \_\_\_\_\_ (c) Homozygous long nose - \_\_\_\_\_  
 (b) Purebred squarepants - \_\_\_\_\_ (d) Hybrid yellow body - \_\_\_\_\_

4. One of SpongeBob's cousins, SpongeBillyBob, recently met a cute squarepants gal, SpongeGerdy, at a local dance and fell in love. Use your knowledge of genetics to answer the questions below.

(a) If SpongeGerdy's father is a heterozygous squarepants and her mother is a roundpants, what is her genotype? Complete the Punnett square to show the possible genotypes that would result to help you determine Gerdy's genotype.

What is Gerdy's genotype? \_\_\_\_\_


- (b) SpongeBillyBob is heterozygous for his squarepants shape. What is his genotype? \_\_\_\_\_  
 (c) Complete the Punnett square to show the possibilities that would result if Billy Bob & Gerdy had children.


(d) List the possible genotypes and phenotypes for the kids.

(e) What is the probability of kids with squarepants? \_\_\_\_\_ %

(f) What is the probability of kids with roundpants? \_\_\_\_\_ %

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5. SpongeBob's aunt and uncle, SpongeWilma and SpongeWilbur, have the biggest round eyes in the family. Wilma is believed to be heterozygous for her round eye shape, while Wilbur's family brags that they are a pure line. Complete the Punnett square to show the possibilities that would result if SpongeWilma and SpongeWilbur had children.

- (a) Give the genotype for each person. Wilma - \_\_\_\_\_ Wilbur - \_\_\_\_\_  
 (b) Complete the Punnett square to show the possibilities that would result if they had children.  
 (c) List the possible genotypes and phenotypes for the kids.


- (d) What is the probability that the kids would have round eyes? \_\_\_\_\_ %  
 (e) What is the probability that the kids would be oval eyes? \_\_\_\_\_ %

6. SpongeBob's mother is so proud of her son and his new wife, SpongeSusie, as they are expecting a little sponge. She knows that they have a 50% chance of having a little roundpants, but is also hoping the new arrival will be blue (a recessive trait) like SpongeSusie and many members of her family. If SpongeBob is heterozygous for his yellow body color, what are the chances that the baby sponge will be blue? Create a Punnett square to help you answer this question.

7. SpongeBob's aunt is famous around town for her itty, bitty stubby nose! She recently met a cute squarepants fellow who also has a stubby nose, which is a recessive trait. Would it be possible for them to have a child with a regular long nose? Why or why not? Create a Punnett square to help you answer this question.

8. If SpongeBob's aunt described in #7 wanted children with long noses, what type of fellow would she need to marry in order to give her the best chances? Create a Punnett square to help you answer this question.

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Name: \_\_\_\_\_

## Dragon Worksheet

Data Sheet

Male Gene (1 <sup>st</sup> color)	Female Gene (2 <sup>nd</sup> color)

Trait	Genotype	Phenotype
Fire/No fire (A/a's)		
Toes (M/m's)		
Spikes on tail (Q/q's)		
Tail color (T/t's)		
Body color (E/e's)		
Wing color (L/l's)		
Horn/no horn (D/d's)		

### Analysis/Questions

- Compare your dragon to other dragons around the room. What differences and similarities do you see?
- How do you explain all of the differences, even though the dragons all had the same set of parents?

